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SCIENCE NEWS LETTER

TUE NOV 3 1942
DETROIT

THE WEEKLY SUMMARY OF CURRENT SCIENCE • OCTOBER 30, 1942



Watcher of the Seas

See Page 278

A SCIENCE SERVICE PUBLICATION

Do You Know?

Holland this year suffered from a plague of fleas, due probably to drought conditions.

American civilians ate more food per capita in 1941 and 1942 than ever recorded before.

Germans are reported to have used powder in hand-cannons in 1361; the guns could be fired about once an hour.

Fighting men in training camps in the United States are now eating about four times as much fresh fish as average citizens.

Over 49,000,000 pairs of silk and nylon hosiery, weighing nearly 2,500,000 pounds, have been contributed by American women for use in the war effort.

Japan is reported to have an artificial "meat" made from proteins, vitamins and other substances extracted from wheat-stalks, sweet potatoes and various materials.

Cold welding or mechanical lacing is now used very largely in repairing cracked engines; cracks are drilled and tapped, interlocking studs inserted, and a special sealing compound applied.

England, Scotland, Wales and North Ireland, with an area about the same as Iowa and Indiana combined, produced last year 50% more wheat, twice as much hay, and more beef, eggs, and milk than these two agricultural states together.

SCIENCE NEWS LETTER

Vol. 44 OCTOBER 30, 1943 No. 18

The weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W., Washington 6, D. C. Orth 2255. Edited by WATSON DAVIS.

Subscriptions—\$5.00 a year; two years, \$8.00; 15 cents a copy. Back numbers more than six months old, if still available 25 cents.

In requesting change of address, please give your old address as well as the new one, at least two weeks before change is to become effective.

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Cable address: Scienserv. Washington. New York office: 310 Fifth Avenue, CHicker- ing 4-4565.

Entered as second class matter at the post-office at Washington, D. C., under the Act of

Question Box

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Seven per cent of Canada's meat supply is from wild birds and game; in the United States 1.4% is from this source.

March 8, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and in the Engineering Index.

The Science Observer, established by the American Institute of the City of New York, is now included in the SCIENCE NEWS LETTER.

The New York Museum of Science and Industry has elected SCIENCE NEWS LETTER as its official publication to be received by its members.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., Pennsylvania 6-5566; and 360 N. Michigan Ave., Chicago. STATE 4439.

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BIOCHEMISTRY

Microbe Rodent Killer

New microbe extract, tried on laboratory mice as germ-killer, killed the mice instead; now seen as possible poison for rodent pests.

► A TERRIFICALLY deadly poison, extracted from a microbe that lives in the soil, may presently lighten the labors of modern Pied Pipers whose job is the wholesale elimination of the rodent pests that sabotage our food supplies and carry germs of bubonic plague and other diseases.

The poison was discovered in the course of researches by Prof. Selman A. Waksman and his associates at Rutgers University, New Brunswick, N. J., and the Merck Institute of Therapeutic Research at Rahway, N. J. What the scientists were really looking for was a chemical agent produced by microbes that would be valuable as a germ-killer.

They found a germ-killing substance, which they named actinomycin because the microbe that produced it belongs to the genus *Actinomyces*. It is similar to those microbes whose infections cause certain lung diseases, lumpy jaw in cattle, scabiness in potatoes and a num-

ber of other diseases; but this particular species grew in the soil.

When Prof. Waksman and his co-workers tried actinomycin on various bacterial cultures in glass vessels, they found it had very good germ-killing properties. However, when they tried it on laboratory mice and other animals infected with bacteria, it was not as effective against the germs. Worse still, it killed the animals within 15 or 20 hours.

Actinomycin has a fearful potency as a killer of mice, rats and other rodents, producing fatal results in doses as small as one part by weight to a million parts of the animal's body weight. It is effective both when injected into the animal and when administered in food.

The idea of using the stuff for the treatment of human and animal diseases has been given up. It looks much more promising now as a rat poison, if enough can be produced at reasonable cost.

As a step toward possible eventual

synthetic manufacture, it has been prepared as crystals, and a partial chemical analysis has been made. Actinomycin separates into two parts, designated as actinomycin A and B, respectively. The "A" portion contains carbon, hydrogen, nitrogen and oxygen; one provisional formula for the molecule reads: $C_{41}H_{56}N_8O_{11}$. It will be necessary, however, to determine the molecular composition more exactly, and to learn the details of its internal structure, before any attempts at synthetic production can be made.

Associated with Prof. Waksman in these researches were Dr. Harry J. Robinson, Dr. H. J. Metzger, Dr. H. Boyd Woodruff and Dr. Max Tishler.

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CHEMISTRY

Synthetic Sapphire Now in Production in U. S.

► SYNTHETIC sapphires for bearings in precision instruments essential in the war effort are now being produced commercially in sufficient quantities to meet the principal demands. This commercial production in America is a war development made necessary by the halting of the importation of European products.

Sapphire and ruby are both varieties of the mineral corundum, which is aluminum oxide. They are made by fusing extremely finely powdered aluminum oxide in an oxy-hydrogen flame in a special furnace. The product, unless coloring is added, is colorless.

Sapphire and ruby differ only in color. The coloring is obtained by mixing certain metallic oxides to the corundum powder before it is fused. Colorless sapphire is used usually for bearings. Coloring is added as a rule only when they are wanted for jewelry or for bearings in watches.

The value of the sapphire for bearings is its hardness. It ranks next to diamond. The average sapphire boule weighs about 200 carats. The term "rod corundum" is applied to synthetic sapphires of a long crystal form.

Spinel, another synthetic mineral, a red variety of which is called spinel ruby, is made from magnesium aluminum oxide. It is not as hard as sapphire but is harder than glass or steel. It also is used for bearings but is not yet being produced in commercial quantities.

Colorless sapphire was first formed in England about 40 years ago by means of what is called the Verneuil inverted



MODEL LAUNCHING—The narrowness of the Tennessee River at Decatur, Ala., makes it necessary for the Ingalls Shipbuilding Corp. there to resort to side launchings. While a ship is still in the blue print stage, a six-foot model is constructed and tested out in a tank which approximates, proportionately, the river's width. After it has hit the water, the model is closely observed for heel-over and the distance it floats before coming to rest.

blowpipe method. Before then synthetic sapphire was opaque. Verneuil dropped finely powdered aluminum oxide through the flame of an oxy-hydrogen inverted blowpipe. The powder melted in the flame and small droplets fell on a fire-clay rod placed below.

CHEMISTRY

Army Insecticide

New aerosol dispensers for protection of the Army overseas from malaria mosquitoes use Freon and pyrethrum, a concentrated flower extract.

► MOST of the pyrethrum supply arriving in the United States is now going into the new aerosol dispensers for protection of the Army from malaria mosquitoes in critical overseas areas.

Little pyrethrum will be available, the Agricultural Insecticide and Fungicide Association told its membership, for agricultural use and almost none for the familiar household insect sprays. Other materials must be substituted for these purposes.

The supply of Freon, a non-poisonous gas used for refrigerating systems, is also used for the dispensers and can now be released only for essential refrigeration systems. The number of aerosol dispensers sent to the fighting fronts is very large, according to OWI reports.

The aerosol dispenser for control of insects is a new product. According to reports from the Agricultural Insecticide and Fungicide Association, the dispenser is a hand-size steel cylinder containing highly compressed Freon gas, a highly purified and concentrated pyrethrum extract and some sesame oil. The soldier unscrews a valve. Immediately a fine jet of gas and pyrethrum extract shoots out, resembling light smoke or fog, which kills mosquitoes. The finely-divided, fog-like particles are what is called "aerosol."

It takes only an instantaneous "shot" from the dispenser to get rid of mosquitoes inside a pup tent. A somewhat longer time will serve inside a bomber or transport plane. The one-pound dispenser can discharge the aerosol for almost 15 minutes and meanwhile treat a space 200 by 100 by 10 feet.

Of the chemicals shot from the dispenser and combining to make the aerosol, the most familiar ingredient is

several crystals formed, but soon one began to grow at the expense of the others. As more powdered corundum was added this larger crystal became an inverted, clear, pear-shaped mass or boule. Commercial methods were developed later from Verneuil's earlier work.

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completely self-sufficient in this important chemical.

Potash ores are at present extracted from underground beds in essentially the same way as coal, which involves the loss of great quantities of the mineral by leaving it in pillars to hold up the roof.

Dr. Cross' method is adapted for the extraction of one kind of potash mineral, sylvinitite, which is mainly potassium chloride. It consists in driving a shaft into the bed, running a superheated solution of the chloride down through a pipe, collecting the saturated brine that rises in the return flow, and crystallizing out the potash salt. Common salt, or sodium chloride, which is present as an impurity in the mineral, is eliminated from the final product by suitable manipulation of the crystallizing temperature and concentration.

The method can also be modified for use in beds that have already been partly exploited by the old room-and-pillar mining.

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METEOROLOGY

Infra-Red Rays Penetrate Smoke in the Atmosphere

► WHEN THE AIR is full of smoke, much more infra-red radiation reaches us than visible or ultraviolet. In fact, infra-red rays penetrate a smoky atmosphere much better than formerly realized, it appears from a report made by Irving F. Hand of Blue Hill Observatory to the American Meteorological Society.

Calculations were made of the relative amounts of radiation that should be received of sunlight and light composed of only the longer wavelengths. These checked closely in the case of a smoke-free atmosphere, but differed noticeably when there was smoke, Mr. Hand stated.

"The range between the maximum and minimum values of total radiation during a ten-minute period in the presence of smoke was 2.3 times as great as the range between the maximum and minimum values of infra-red radiation," Mr. Hand pointed out.

Local forest fires which raged 20 miles or so west of the observatory furnished an excellent opportunity to study the change in radiation reaching the earth. Simultaneous measurements were made immediately before and during the passage of the smoke cloud.

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GEOLOGY

Hot-Water Mining Method For Potash Salt Invented

► POTASH for war supplies and fertilizer can be more completely and efficiently extracted from the depths of the earth by hot-water "mining" than by the present shaft-mining system, is the claim of Dr. Roy Cross, Kansas City chemical engineer, who has just been granted U. S. patent 2,331,890 on his new method.

The potash mining industry is relatively new in this country. At the time of World War I, we were completely dependent on the German potash mines, so that American industry and agriculture were hard hit until emergency sources could be developed. Since then, great potash deposits have been opened up in the Southwest, and we are com-

ASTRONOMY

Most Used Telescope

Eleven-inch instrument, once largest in the U. S., to be featured in centenary celebration of University of Cincinnati Observatory.

► THE CENTENARY of the University of Cincinnati Observatory, possessor of a telescope once second largest in the world and largest in the U. S. A., will be celebrated in Cincinnati during the first week in November when the American Astronomical Society will hold its annual meeting.

The pioneer 11-inch glass is still in regular service and it is believed that it has been used by more thousands of stargazers than any other telescope in America. When it was built the telescope was exceeded in size only by the instrument of the Royal Imperial Observatory at Poulkovo, Russia.

The principal speaker at the centenary will be Dr. Harlow Shapley, director of Harvard Observatory and president of the American Astronomical Society.

Founded a century ago as the first observatory to be erected in the United States with public funds, the University of Cincinnati Observatory was as much of a national scientific showplace then as one of the large planetariums of today. The cornerstone was laid Nov. 9, 1843, by John Quincy Adams, sixth president of the United States, then 77 years of age. He made the two weeks' journey from his New England home by railroad, lake steamer, canal packet and stage coach.

Founder of the observatory, virtual builder of its original structure, and purchaser of this first telescope was Ormsby MacKnight Mitchel, professor of natural philosophy, mathematics and astronomy at Cincinnati College, founded in 1819 and forerunner of the University of Cincinnati. Professor Mitchel quarried his own stone, dug his own sand, burned his own lime, dammed a small stream of water, supervised construction of the building—then served without pay for two decades.

Ground on a Cincinnati hilltop was donated by Nicholas Longworth, grandfather of the late Speaker of the House, Nicholas Longworth. Since the laying of the cornerstone this site has been known as Mount Adams, in honor of John Quincy Adams' part in the city's history. Because of the increasing city haze, the

observatory was moved in 1873 to its present site on Mount Lookout, several miles farther from the downtown area.

Professor Mitchel was the observatory's first director, serving until the Civil War. He left to join the Union forces and died of yellow fever at Hilton Head, N. C. In 1846 he began the publication of the monthly *Sidereal Messenger*, first astronomical periodical in the United States.

He was succeeded by Prof. Cleveland Abbe, who inaugurated at the observatory a system of telegraphic weather reports which aroused such interest that the United States Weather Bureau was organized to offer the same service on a nationwide scale. Thus this observatory claims to be the mother of the U. S. Weather Bureau.

The present director is Dr. Everett I. Yowell, University of Cincinnati graduate, acting in a temporary capacity until a successor to the late Dr. Elliott

Smith, the Observatory's sixth director in 100 years, is named. Dr. Smith died Sept. 29 of this year.

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BACTERIOLOGY

Plague Germ Survives 20 Years in Test Tube

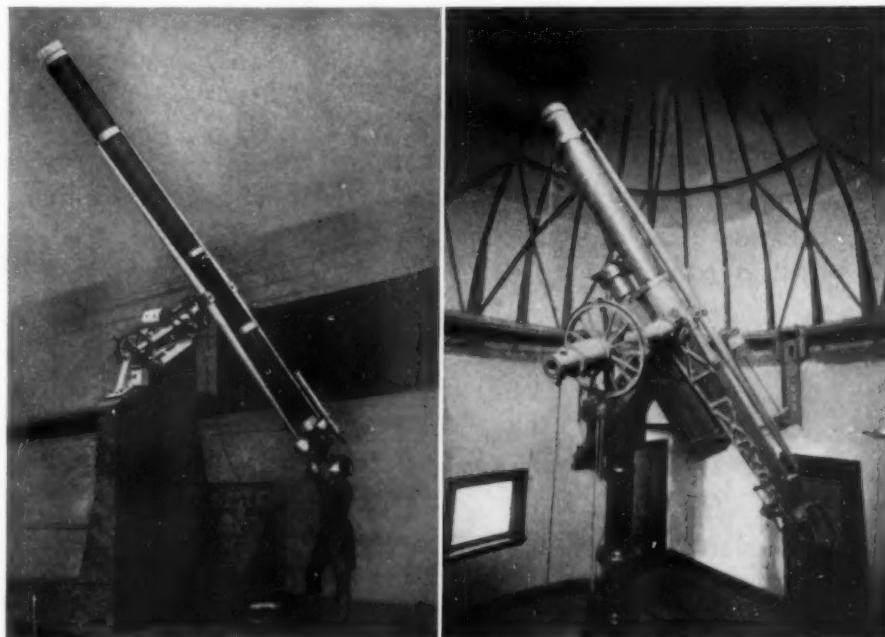
► AFTER 20 years' imprisonment in a test tube at a temperature of 50 degrees Fahrenheit, the *Bacillus pestis*, dread agent of the plague, emerged alive and as deadly an enemy as ever, the United States Public Health Service reveals.

In 1922, this public enemy was isolated from a California ground squirrel and subsequently passed through guinea pigs. From the guinea pig cultures, one series of tubes was prepared in 1923 in which the "killer" was isolated, and a similar series set up in 1924.

Showing no loss of its deadly strength as a result of the two decades of confinement, the plague germ, when released from the 1923 series and injected into guinea pigs, promptly infected them.

A series of tubes prepared in 1924 is to be opened at some future date. At that time the scientists may be able to determine how many years would approximate a term of "life imprisonment" for the microscopic killer, *Bacillus pestis*.

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THEN AND NOW—Prof. Ormsby MacKnight Mitchel, first director of the 100-year-old Cincinnati Observatory, is shown in a contemporary print (left) at the original 11-inch telescope. This instrument, the second largest in the world in 1843, is still in use today (right). Through its lenses have peered more stargazers than through any other American telescope.

SOCIOLOGY

Post-War Job-Planning

Over 1,000 American cities and small towns are already taking action to provide post-war jobs for returning soldiers and demobilized war workers.

► IN OVER a thousand American cities and small towns, action is already being taken to plan for after-the-war jobs for returning soldiers and the men and women released from war industries, it is indicated by reports and letters received by U. S. Department of Commerce officials.

Surveys are being made by local communities to assay the resources of the locality in plant facilities, skilled labor, raw materials that might be useful in the new industries expected to develop as soon as peace makes it possible. Fact-finding searches are being made for post-war opportunities in manufacture of new war-born plastics, light-weight metals, new fertilizers, new farm machines and new food processing industries.

It is known that soldiers coming home after the war will be trained in hundreds of technical jobs that will fit into industries yet to be. Concerning many of these, officials can not even speculate out loud, because details regarding them

are in the secret class. Now these details might be of help to the enemy. It is generally known, however, that soldiers trained to operate and service modern devices of war in the field of radio, for example, will be expertly fitted to develop and build startling new instruments to make the post-war world more comfortable and more fun to live in.

And the men and women trained in war plants to work with the new plastics for building all sorts of things from canteens to airplane parts, can open up whole classes of manufactures for more colorful and convenient homes and offices when peace comes.

As a means of combining plans for post-war employment with plans for better community living when peace brings more time to individuals, communities are also beginning to inventory the local opportunities for social and recreational activity, for schooling and for civic betterment.

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MEDICINE

Eye Flash Exposures

Greater protection of welders' eyes from intense light of welding arcs may be achieved by use of new rule for estimating safe exposures.

► A PRACTICAL method for giving the 100,000 or more welders in the nation's shipyards greater protection from "eye flash" was described by Dr. Philip Drinker, of Harvard School of Public Health and the U. S. Maritime Commission, at the conference on industrial medicine held in Boston by the American Mutual Liability Insurance Company.

The method was worked out in co-operation with Dr. V. Everett Kinsey and Dr. David G. Cogan of Harvard Medical School, and details are reported in the *Journal of the American Medical Association* (Oct. 16).

The probable danger to the eyes in any given welding situation, these scientists found, can be determined by meas-

uring the intensity of light from the welding arc with a light meter calibrated in foot candles. The measurements must be made at night to avoid interference by sunlight. The light meter does not measure the ultraviolet light from the welding arc, which is what does the damage to the eyes. In special experiments with a tantalum photoelectric cell and click meter, however, it was found that the light meter readings paralleled the ultraviolet radiation and so could be used as a guide in determining exposure to dangerous amounts of ultraviolet.

Part of the experiments were made with laboratory animals and part with human volunteers who held their eyes

open seven feet from a welding arc for periods of 20 and 30 seconds. From these tests, the scientists believe that about 150 foot-candle minutes would represent the average exposure coefficient necessary to produce minimal eye injury in half those exposed to the radiation.

A person working near where welding was being performed might, for example, accumulate through repeated exposures during the day a total of 15 minutes of exposure. He would be in danger of eye trouble if the intensity at the distance he was from the arc was 10 foot candles or more.

A minimum standard of safety for those in the neighborhood of electric welding arcs, the scientists recommend, would be one-tenth the time and intensity of radiation required to produce minimal effects on the eyes. Since it would be difficult in actual working conditions to determine the probable time a person might be exposed, it would be safer to provide protection in the form of shields or goggles unless a safety factor of about tenfold could be allowed.

Actually, the idea of "flash" exposures is not in line with the time of exposure found necessary to produce symptoms, the scientists found. They state that there is apparently little need to provide protection for persons who will only be exposed to the welding arc momentarily.

Any spectacle or goggle having a thickness of two millimeters or more, whether colored or not, they point out, will provide practically complete protection from electric arc welding if there are shields at the sides.

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AERONAUTICS

U. S. Navy's Flying Boats Superior to Jap Plane

See Front Cover

► A MARTIN MARINER is shown in an official U. S. Navy photograph on the front cover of this week's SCIENCE NEWS LETTER. It leaves a white-ribbon wake as it lands in the harbor of an east coast Naval Air Station.

These twin-engine, gull-wing patrol bombers fly for the Navy on anti-submarine patrol, protect convoys and operate as cargo carriers for the Naval Air Transport Service. They have a range of 3,000 miles, compared with the Japanese Kawanishi, which has a range of 2,100 miles. The Martin Mariners also have an even greater superiority in bomb-load capacity.

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AERONAUTICS

Super Bomber Coming

Giant plane is already in production and scheduled to enter combat next spring; details of its size, cruising range, etc., are still secret.

► A BIGGER, better, blasting bomber is being born which will smash at the Axis and Japanese Empire with more deadly power than the Boeing Flying Fortress B-17 and the Consolidated Liberator B-24. An unspecified number of these new "super-bombers," carrying more explosives, heavier firepower and having a greater range than any existing warplane, have already been delivered to the Army within the last several weeks.

Details are still military secrets. Future reports will tell its size, cruising range, how high it flies, number of these planes scheduled for production, how long it takes to build and get into combat, if any are as yet in actual combat, number of men required for each crew, what guns and how many engines.

The deadly new air giant has been identified as the B-29. However, the War Department has no official word to offer on the new super-bomber and does not even acknowledge its designation as the B-29.

This much is official from the Office of War Information: "Already in production and scheduled for entry into combat by the spring of 1944 is a considerably larger and more potent bomber which will eventually take over the job of super

long-range bombing."

The same OWI report points out that the big B-17's and B-24's are now sometimes referred to in the Air Forces as "the last of the small heavies."

The super-bombers are powered by Cyclone 18 engines, built by a plant of Wright Aeronautical Corporation.

The first hint the public had of the giant bomber came some months ago from Gen. H. H. Arnold, commanding general of the Army Air Forces, who spoke of "a secret weapon or two up our aerial sleeves that will deal paralyzing blows to our enemies" and predicted that entirely new "battle-wagons" are on the way. (See SNL, Sept. 11)

According to a recent report, the Flying Fortress also is undergoing changes to increase its bomb load to ten tons, making it the heaviest in the world—until, presumably, the new super dreadnaught of the sky gets into the fighting.

The box score by plane types issued by OWI shows that among Army planes the heavy bombers have the best record. Aircraft production figures for the past several months indicate an increase of heavy bombers over other type aircraft being built.

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U. S. ARMY FIELD JACKET—Exhaustive field tests and suggestions from the fighting fronts have led to the development of this new jacket. Its advantages over the present jacket include buttons covered with flaps to prevent their catching on objects or brush and a cord that can be drawn tight at the waist to shut out the cold.

the probable depth of the pit is 6,000 feet.

Mayor Bernabe Rios of Tasco, the nearby town, has decided to close the entrance to Hell's Mouth by dynamiting it or by otherwise barring access to the entrance. In this way he feels that he can remove from Tasco the notoriety connected with the pit.

Ordonez and Mongez will survey Hell's Mouth with the assistance of American miners working in Tasco. If it is found that it is not of geological interest, the pit will be sealed; if, however, the survey shows the pit may have geological value, further exploration will probably be made.

It is expected that the survey will also answer the question of whether or not Hell's Mouth is an entrance to the famous Cacahuamilpa Caves, located in the same region. Mineral formations clearly indicate that this pit has an origin similar to or common with the caves.

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GEOLOGY

Hell's Mouth in Mexico

Mexican scientists to explore huge pit over a mile deep for possible geological interest before threat to dynamite its entrance is carried out.

By AGUSTIN ARAGON LEIVA

Science Service Mexican Correspondent

► EZEQUIEL ORDONEZ, dean of Mexican geologists, and Ricardo Mongez Lopez, geophysicist and dean of the faculty of sciences of the National University of Mexico, will soon explore a mineral-lined pit, believed to be over a mile deep, which is located 80 miles south of Mexico City.

Many legends surround this enormous pit, called Hell's Mouth or Devil's Pit.

Tradition says that Indians used the pit to kill enemies and punish criminals. Spaniards threw prisoners into its depths. During Mexico's Independence War and the civil wars which followed, men and women were entombed in the pit.

The rumors are that gangster murders have recently been committed in Hell's Mouth. In hunting for the body of a victim, searchers descended 1,500 feet into the pit. Cold, wind, and lack of air prevented a lower descent. From various measurements taken, it is estimated that

SPORTS

Four Minute Mile Running Record Possible

► WHAT ARE your chances of breaking a running record? If you are in training, you can find out by checking your speed against the curve which has been mathematically calculated by Dr. Alfred W. Francis of Woodbury, N. J., to represent the cream of the crop of official world's records. With the aid of these statistics, Dr. Francis predicts (*Science*, Oct. 8) that the "hypothetical four minute mile" never yet officially attained, is an imminent possibility.

Because a runner can maintain a greater speed for a shorter span, records for various distances can not be compared as such to determine which is the better speed. Dr. Francis analyzed the official world's records, and correlating speeds with distances, plotted a curve which is representative of the greatest speeds which have been attained.

Using Dr. Francis' statistical method, runners can compare their running time, regardless of distance, with the world's best. When properly plotted on the graph, the closer the race comes to the curve, the closer it approaches the world's record. Overtake the curve, and you've broken a record!

In terms of speed-distance correlation, the best recorded speed is that reached by Gunder Haegg in the 5,000 meter race. Because this speed is far superior to that of Arne Andersson, holder of the mile record (4:02.6), Dr. Francis predicts that Andersson's record should soon be broken and a "four minute mile" record become a reality.

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MEDICINE

Viscose Tubing for Blood Transfusions Saves Rubber

► USE of heavy viscose tubing instead of rubber tubing in blood-transfusion apparatus results in fewer reactions dangerous to the patient and saves rubber, Henry Naftulin, Dr. A. M. Wolf and Dr. S. O. Levinson of Michael Reese Hospital, Chicago, report. (*Journal, American Medical Association*, Oct. 9)

Cleaning rubber tubing for transfusion apparatus is difficult, and the drastic procedure necessary eventually destroys the elasticity of the rubber, the quality which makes it desirable for transfusion work. Incomplete cleansing of the rubber tubing is believed a major

cause of the chill and fever that sometimes follow transfusions.

Heavy-walled viscose tubing is sturdy enough to be used for transfusions, and this cellulose plastic costs so little that it can be used once and discarded. In a total of 1,137 blood transfusions given through this tubing, there were only eight reactions, three of them allergic. The Chicago doctors find this a material decrease from the rate with rubber tubing.

Science News Letter, October 30, 1943

PSYCHOLOGY

Old Idea of Sovereignty Must Yield to New Concepts

► THE OLD-FASHIONED idea of sovereignty will have to give way to newer concepts of the power of the state, more in accord with the new science, the new technology and, the new reason and reflection from which our new civilization is formed, Dr. Charles E. Merriam of the University of Chicago, told the opening session of the Fourth Conference on Science, Philosophy and Religion in New York.

The sovereignty that was the rational defense of irrational deeds is dead, Dr. Merriam said. Within any sane nation, it has always been limited by justice, liberty and general welfare. If a governing body legislated that all blue-eyed babies should be put to death, that might be the law, but at that point psychiatrists would be needed, he contended, rather than jurists.

Science News Letter, October 30, 1943

RESOURCES

Rubber-Producing Guayule Processed in California

► WILD GUAYULE shrubs are being gathered in southwest Texas by the U. S. Forest Service to contribute to the natural rubber supply needed by the armed services. The quantity which can be collected is small, but it will help. The shrubs will be processed in the government guayule plant in California.

The general area from which the guayule is now being gathered once produced a commercial rubber which was processed in a guayule mill at Marathon. It closed in 1926. Some 2,000 tons of shrubs, it is estimated, may be secured now in rough country surrounding the area harvested for this mill.

First shipments are now being made. Plants and roots both produce rubber; they are gathered and baled together.

Science News Letter, October 30, 1943

IN SCIENCE

MEDICINE

Alkalized Beef Plasma May Be Safe for Transfusion

► ALKALIZING beef blood plasma for a short time may be a method for making this a safe substitute for human plasma in transfusions, it appears from a report by Dr. Julian H. Lewis, of the University of Chicago. (*Science*, Oct. 22)

The beef plasma is treated with alkali for one hour at body temperature and then the alkalinity is neutralized. This modified beef plasma saved dogs from what would otherwise have been fatal shock following severe hemorrhage. Whether the alkalized beef plasma can be safely used for human transfusion is not stated. It did not cause reactions in either dogs or guinea pigs as untreated beef plasma would.

Destruction of the substances, called antigens, in beef plasma which would cause reactions is believed due to destruction by the alkali treatment of cystine and possibly other amino acids in the beef plasma.

Science News Letter, October 30, 1943

CHEMISTRY

Chicken Feathers Salvaged By Treatment with Acids

► THANKS to a new treatment, chicken feathers, formerly a waste by-product of chicken-dressing plants, are now going to war, supplementing the inadequate supply of duck, geese and other waterfowl feathers. Feathers are camouflage material in this war, as well as stuffing for sleeping bags and pillows.

The treatment is with a preservative which keeps wet-picked chicken feathers from decomposing after plucking and before processing. Normally they start to decompose in two days or less. Now it is found that if they are thoroughly soaked in a weak solution of two inexpensive acids and dried they will remain in good condition for weeks.

The process was developed by Dr. J. I. Hardy of the U. S. Department of Agriculture. The solution used is 0.55 pound of salicylic acid, 1.1 pounds of benzoic acid, well stirred in 30 gallons of lukewarm water. This treatment does not injure the fluffiness of the feathers.

Science News Letter, October 30, 1943

NE FIELDS

DENTISTRY

Wear From Toothpaste Or Solutions Measured

► IF YOU want to know whether your favorite tooth powder or paste is wearing out your teeth, the National Bureau of Standards has a scientific test. The Bureau now has developed a method to measure accurately the abrasive effects of tooth-cleaning preparations, and also the wearing effects on the teeth, if any, of various solutions used as mouth washes.

In measuring tooth-wear from abrasion or solution, the Bureau uses an "indenter" of diamond hardness developed in its laboratories a few years ago. An extracted tooth is first polished and then scratched with it, making an indentation of known size. It is then polished mechanically with the dentifrice, or dissolved in a solution. The degree of disappearance of the marks indicates the hardness of the tooth, or the wearing effect of the polishing material or of the solution.

Science News Letter, October 30, 1943

GENERAL SCIENCE

Western Cultural Leaders Meet in Washington

► CULTURAL LEADERS in the Western Hemisphere met recently in Washington in a wartime session to consider how best to promote scientific and scholarly cooperation.

The Inter-American Committee on Intellectual Cooperation, under the chairmanship of Dr. Miguel Azorio de Almeida, Brazilian physiologist, is a Western Hemisphere regrouping of the national committees on intellectual cooperation that were organized under the League of Nations a decade ago.

Conferences were held in the buildings of the Pan-American Union and the Carnegie Endowment for International Peace, with those organizations and the Division of Cultural Relations of the State Department cooperating in the program.

Dr. Waldo G. Leland, director of the American Council of Learned Societies, recently named chairman of the American Committee on Intellectual Coop-

eration, was instrumental in arranging the hemispheric conference.

The American delegate to the meeting was Dr. James T. Shotwell, of Columbia University, honorary chairman of the American committee.

Other delegates were: Dr. Victor Lascano of Argentina, Dr. Julian Nogueira of Uruguay, Dr. Alfonso Reyes of Mexico, Dr. Cosme de la Torriente y Peraza of Cuba and Dr. Oscar Vera of Chile. Dr. Herminio Rodriguez is secretary of the committee. Technical experts present included: Dr. Robert Valeur of New York, Dr. Mariano Brull of Cuba and Dr. Antonio Castro Leal of Mexico.

Science News Letter, October 30, 1943

NUTRITION

19th Century Buns Had High Vitamin G Content

► TWO CURRANT buns and "a pint of good ale yeast" seem to have stumped the experts! Analysis of two buns—one baked in 1863 to celebrate the wedding of the Prince of Wales and the other in 1887 for Queen Victoria's jubilee—reveals an unaccountably high riboflavin (one of the B vitamins) value, E. C. Barton-Wright, T. Moran and H. S. Sarson, three British scientists, report to *Nature* (Sept. 4), British scientific journal. The key to the solution lies in "a pint of good ale yeast."

The probable recipe for the buns is similar to that of the Hannah Glass 1780 recipe which reads: "Take two pounds of fine flour, a pint of good ale yeast, and three eggs beaten, knead all these together with a little warm milk, a little nutmeg, and a little fat, and lay it before the fire till it rises very light, then knead in a pound of fresh butter, a pound of rough caraway comfits, and bake them in a quick oven, in what shape you please, on floured paper."

However, there is a catch. Should you attempt to follow the recipe, you would not obtain the high riboflavin value derived by the Victorians. Because, apparently, a pint of good ale yeast today is not what it used to be in the days of Queen Victoria. The riboflavin value in a pint of good ale yeast in those days far exceeded that of today's. This may be due to the higher specific gravity of 19th century beer. Or it may be inherent in the yeast itself. Nevertheless, beer or yeast, it appears to have been an attractive way for catching up on vitamin intake!

Science News Letter, October 30, 1943

METALLURGY

New High-Voltage Device Used in Arc Welding

► THANKS to a new electric device developed in East Pittsburgh, Pa., better and speedier results are obtained in the process of electric welding of delicate aluminum and alloy steel plates used in warplane construction.

The device is a high-voltage "trail blazer" that cuts an electric path through the air which is followed by the low current that does the actual welding, making it certain, reliable and constant. Low currents must be used in arc welding thin metals or the metals will burn. Without this device it is difficult to start the electric arc and to keep it glowing while the weld is made.

The new device, a development of the Westinghouse Electric and Manufacturing Co., is built into the arc-welding machine. In use the operator flicks a switch holding the tip of the rod near the work. The high-voltage current leaps across the gap and the welding current follows. Both currents keep flowing until the weld is finished.

Science News Letter, October 30, 1943

INVENTION

Heated Ironing Board Invented for Housekeeper

► HELPING the housekeeper seems to have been the uppermost thought among Patent Office officials judging from the number of household appliances included in the 592 patents issued during a recent week. A heated ironing board is one of particular interest.

Infra-red ray lamps placed under the ironing board furnish the heat. They are safely housed in a protecting shelter arranged so that the heat is thrown to the under side of the board where it may properly warm the board and its ironing surface. The shelter is ventilated and the heating units are easily replaced.

The ironing surface is a single sheet of perforated material, with some 40% of its area taken by the perforations. This permits the maximum transmission of heat to the covering cloth and to the articles being ironed.

This heated ironing board is used with the ordinary folding stand or in the ordinary cabinet. The patentee, Horace B. Fay of Willoughby, Ohio, has assigned the patent to the Gridiron Steel Co. (No. 2,331,673)

Science News Letter, October 30, 1943

ASTRONOMY

Mars Unusually Bright

This planet, named after the Roman god of war, makes a close visit to the earth in November. Vega is brightest of the disappearing stars of summer.

By JAMES STOKLEY

► TO THE BRIGHT STARS of winter that are now beginning to appear in the eastern evening sky are added two planets—Mars and Saturn. The former is unusually bright because this month it makes an approach to the earth closer than any it has made for the past two years, or than any it will make for many years to come. As a result Mars reaches the magnitude of minus 1.5, which is brighter than any other planet or star seen in the evening sky. The position of Mars is shown on one of the accompanying maps (depicting the heavens for 11:00 p. m. wartime on Nov. 1, and for 10 p. m. on Nov. 15). It is in the constellation of Taurus, the bull, in the east just to the left of the star Aldebaran.

On Nov. 28, when Mars makes its closest approach of this visit, it will be 50,120,000 miles away, which is relatively very near. Under very rare conditions, which last occurred in 1924, it comes to within 35,000,000 miles. When Mars makes such a close approach, it is always far to the south, which means that for us northern observers it is low in the sky. Just now, on the other hand, it is close to the place where the sun is at the beginning of summer, and so, during these nights, it rises as high in our sky as it possibly can. Thus, at many astronomical observatories telescopes are trained on this red planet to add new data that may help answer many problems as to its nature.

Two Groups of Bright Stars

The brightest stars to be seen on November evenings may be divided roughly into two groups. Toward the west are those of last summer and early autumn, now disappearing from view, while in the east the wintertime groups are beginning to appear. Vega is the brightest of the first class; it is in Lyra, the lyre, in the northwest. Above this is Cygnus, the swan, with bright Deneb. To the left is Altair, in Aquila, the eagle.

To the east we can see Aldebaran, in Taurus, near which Mars stands. Far-

ther toward the north is bright Capella, in Auriga, the charioteer. Below Auriga are Gemini, the twins, of which Pollux is the brighter. Below Aldebaran is Orion, with two stars of the first magnitude, Betelgeuse to the north and Rigel to the south. Between them are the three stars, now in a vertical row, that mark Orion's belt.

The Winged Horse

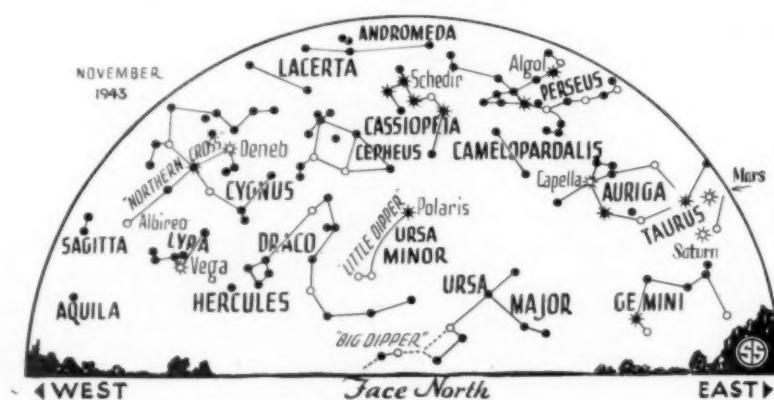
High in the southern sky is the "great square" of Pegasus, the winged horse. These stars are not of the first magnitude, but their arrangement makes them easy to find. Extending a line from the right hand side of the square down to the horizon, we come to Fomalhaut, in Piscis Austrinus, the southern fish, another first magnitude star. This is not the only fish in the sky, for below and alongside the square is the constellation of Pisces, the fishes. There are supposed to be two of them, tied together with a string. The little ring of stars directly below the square is the "circlet of the western fish." The eastern one is not as well defined.

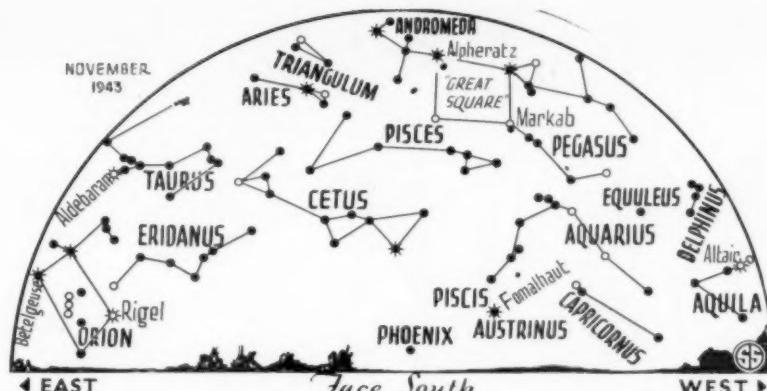
Of all the planets, except for the earth, probably none has been better publicized than Mars. It has been a favorite subject for writers both of science and pseudo-science, largely as a result of speculations about it as the possible abode of life. Back in 1877, when it made an unusually close visit, two important discoveries were made in con-

nexion with Mars. At the U. S. Naval Observatory in Washington, Asaph Hall discovered its two curious little moons, Deimos and Phobos; the latter goes around faster than the planet rotates so that, from the surface of Mars, it would be seen to rise in the west and set in the east. The other discovery took place at Milan, when the Italian astronomer, Giovanni Schiaparelli, discovered on its surface curious markings which he called "canali" or "channels," though the word has been mistranslated into English as "canals."

Even today the exact nature of these so-called canals is not known. Many years ago an eminent American astronomer, Percival Lowell, founder of the Lowell Observatory at Flagstaff, Arizona, speculated that they were real canals, dug by intelligent beings as an irrigation project to carry Martian waters from the melting snows around the poles to regions where it would be used. Later studies have failed to confirm Lowell's intriguing suggestion, and today his Martian theories are not widely accepted. Since observations with the spectroscope have shown that there is no appreciable oxygen or water vapor on Mars, the possibility of life seems very unlikely.

However, there are dark greenish areas visible on the planet which come and go with their seasons, changing to brown in the autumn and back to green in the spring. This behavior strongly suggests that of vegetation, so it may be that there is vegetable life on Mars. If so, it is likely to be of a very different nature from any that we know, as it must be adapted to the conditions of that planet's atmosphere.





* * • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

CELESTIAL TIME TABLE

November, 1943

Nov.	EWT	PHENOMENON	
3	7:44 p.m.	Algol (variable star in Perseus) at minimum.	19 6:00 a.m. Moon farthest; distance 251,200 miles.
4	11:22 p.m.	Moon at first quarter.	5:03 p.m. Moon passes Jupiter.
6	6:00 a.m.	Moon nearest; distance 229,-800 miles.	6:43 p.m. Moon in last quarter.
11	9:26 p.m.	Full moon.	21 12:38 a.m. Algol at minimum.
14	5:50 a.m.	Moon passes Mars.	22 2:18 p.m. Moon passes Venus.
	4:36 p.m.	Moon passes Saturn.	27 9:27 p.m. Algol at minimum.
16	early a.m.	Leonid meteors visible.	28 11:23 p.m. New moon.
	12:00 a.m.	Venus farthest west of sun.	29 9:00 a.m. Mars nearest; distance 50,120,000 miles.
18	3:49 a.m.	Algol at minimum.	6:00 p.m. Uranus nearest; distance 1,-707,000,000 miles.

Subtract one hour for CWT, two hours for MWT, and three for PWT.

Science News Letter, October 30, 1943

ORDNANCE

Nazi Rocket Weapon

German use of these time-fused explosives against American heavy bombers is admission of inadequacy of their fighter planes and their armament.

GERMAN USE of high-explosive rockets launched from fighters at a respectful distance from the deadly defensive gun armament of American heavy bombers is in itself a confession of the inadequacy of their own fighter planes and their machine guns and cannon. To this extent, Gen. H. H. Arnold's newest gibe about the tactic's birth from the brains of "long-haired scientists" is justified.

General Arnold, however, may have been giving long-haired German theorists credit for more originality than they exercised. The business of launching rockets from tubes under the wings of fighter planes seems rather to have been an invention of short-haired Soviet soldiers; though in their case the attack was against targets on the ground rather than in the air, when they fired rockets from specially equipped Stormovik low-altitude strafing planes against Nazi tanks. The main difference is that the anti-tank rockets were fired by contact fuses, like ordinary naval shells, whereas the anti-bomber rockets of the Luftwaffe

are of necessity fired by time fuses like the projectiles sent up by ack-ack guns on the ground. The burst of such a shell within 20 or 30 yards of a plane will damage it, and may destroy it, depending where the flying fragments strike.

Neither German, Italian nor Japanese fighters have been able to solve the problem of Fortresses or Liberators flying in close formation, and able to bring overwhelming numbers of .50-caliber machine guns to bear against any oncoming attacker. Although enemy fighters usually include light cannon of materially greater than half-inch caliber in their armaments, most of these bigger weapons have shorter effective ranges than that of the heavy American machine guns. Hence the attempts to find a longer-range weapon that will not expose the fighters of the defense forces to such great risks. First, time bombs were tried, intended to burst in the midst of the compact American bomber formations; they were not particularly successful. So now the rockets are having their day.

This is not the first time that German planes are reported to have used rockets as a means of attack. During the period of Axis ascendancy in the Mediterranean, Nazi bombers were said to be dropping heavy, armor-piercing bombs with rocket charges in their tails, in attacks on British battleships.

The theory of this was that no dropped bomb ever gets up enough velocity from the force of gravity alone to pierce thick deck armor, but that the rocket charge might give the bombs a sufficient added downward push to make them the equivalent, in penetration, of shells hurled from big-caliber guns. This kind of rocket attack, if it actually took place, seems not to have had much success, for little has been heard of it for well over a year.

The Germans, like the Russians, have paid a good deal of attention to the possibilities of rockets during the present war. Both Russians and Germans have used multiple rocket launchers on the ground, the Russians in straight rows, the Germans in their now well-known six-barreled "Nebelwerfer," or fog thrower. The latter, a weapon that looks like an exaggerated version of the old-fashioned "pepperbox" revolver, launches projectiles of ordinary field-gun caliber. Its name indicates that it is intended primarily for the laying of concealing smoke screens, though the Russians state that it sometimes throws high-explosive shell as well.

Two other rocket weapons which the Germans darkly hint about in their propaganda broadcasts, a super-long-range, super-big-caliber rocket for cross-channel bombardments, and a radio-directed robot plane claimed to have been responsible for the destruction of the escaping Italian battleship Roma, are both still so thoroughly veiled in the "Nebel" of rumor that any discussion of them would of necessity be more speculative than factual.

Science News Letter, October 30, 1943

MATHEMATICS DICTIONARY

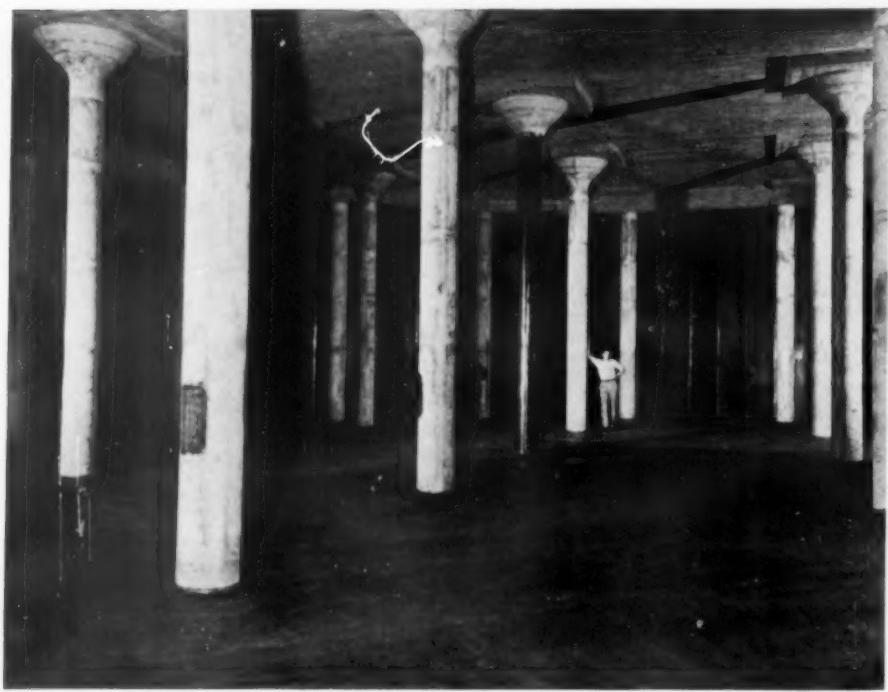
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THE JAMES MATHEMATICS DICTIONARY,

the only such book now published, provides standard definitions of the terms and phrases from arithmetic through elementary differential equations; the technical terms ordinarily used in the applications of these subjects, and more advanced basic terms. Easy examples, many illustrations and all sorts of formulas are included. The appendix contains tables of weights and measures, a list of mathematical symbols and the tables ordinarily used in handbooks.

This dictionary is a great deal more than a collection of definitions. It explains, illustrates and correlates, stressing especially those operations that are hardest to understand. One reader has called it "Ten texts in one."

Available in flexible or non-flexible binding, for \$3.00, from the Digest Press, Dept. 3-B, Van Nuys, California, or Science News Letter.



GASOLINE BOMB SHELTER—This is an "inside" view of one of the vast concrete tanks now being built far underground at strategic coastal points and naval outposts to protect from bomb damage millions of gallons of aviation gasoline and diesel fuels. Everything in the tank is lined with synthetic rubber sheets.

ARCHAEOLOGY

Archaeological Year

First definite evidence on many historical questions unearthed in South American countries by expeditions of the Institute of Andean Research.

► "ARM-CHAIR brooding or treasure hunting of the past has been almost entirely replaced by highly evolved excavation technique combined with exhaustive and exact historical research," Dr. William Duncan Strong, director of the Ethnogeographic Board, told the Anthropological Society of Washington in their first meeting of the season. In support of his statement, Dr. Strong presented the findings of the Institute of Andean Research program for 1941-1942.

Supported by the Art Committee of the Coordinator of Inter-American Affairs the brief archaeological program of the Institute of Andean Research stands out as the widest activity in a single year in the history of Latin-American archaeological research, Dr. Strong said. Some of the "firsts" unearthed by this

archaeological program are as follows:

Venezuela and the West Indies: The first definite evidence of the relationship in pottery styles between the mainland of South America and the islands of the West Indies was obtained.

Colombia: Baths cut out of the bedrock of a shallow stream were found, no doubt the forerunner of the modern sunken bath.

Southern Highlands of Peru: A number of important pre-Inca sites in the Cuzco region were discovered and some of the recorded or vaguely known sites restudied. Inadequate plans of the famous Temple of the Sun will now be replaced by an accurate large-scale plan drawn up by members of the Institute.

Central Coast of Peru: Rich textiles with complex designs which should stimulate not only scholarly interest but the appreciation of artists and designers all over the world were brought to light. Several early civilizations were discovered, including structures containing simple altars that apparently represent the earliest temples yet known in coastal Peru.

Northern Coast of Chile: An unusually complete record of a long period of human occupation was obtained. Evidence shows that the coast or desert area was first settled by a simple fishing population, using two types of fishhooks, one cut from shell, the other a composite hook; bowls cut from lava; barbed harpoons with pressure-flaked stone points; and coarse percussion-flaked stone tools. A sharp break in the cultural pattern implies the arrival of a second non-agricultural fishing population utilizing distinctly different equipment. Then the introduction of agriculture, marked by simultaneous appearance of corn, cotton, gourds and perhaps beans, is accompanied with the first use of pottery, textiles and coiled basketry.

Mexico-United States: Exact relationship between prehistoric cultures of Mexico and those of the Pueblo and lower Mississippi areas in the United States has for some time been a problem worked on by both North Ameri-

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can and Mexican archaeologists. The Institute of Andean Research excavations in both eastern and western Mexico are significant in this regard, Dr. Strong declared. Excavations near Tampico give promise for the first time of linking early levels on the east coast of Mexico with those of the lower Mississippi valley.

American food plants feed a large part of the modern world, and their history is more than coincident with the rise of both ancient and modern

civilizations. Although the expedition secured ancient plant materials which may aid in solving basic problems of plant genetics, the comparative study of these and many other cultural materials awaits the time when American scientists can once more concentrate upon the arts of peace, Dr. Strong explained.

He further predicted that in the post-war world cooperative research along archaeological and other scientific lines will surge forward in all American republics.

Science News Letter, October 30, 1943

ORDNANCE

Cannon-Testing Chamber

Construction which contains compartments that can be regulated for temperature and pressure to simulate stratosphere ready to test aircraft guns.

► A STRATOSPHERE chamber to test new heavy caliber aircraft cannon will soon be ready for its first trial at the proving grounds of the Army Air Forces at Elgin Field, Fla. It occupies a 50-foot space and provides a 22-foot range for the projectiles.

The chamber is similar in general construction to stratosphere chambers used to test instruments and engines. The temperature in it can be lowered from 70 degrees above zero Fahrenheit to 70 degrees below in less than 12 minutes. At the same time the air pressure may be reduced from sea-level pressure, 14.7 pounds per square inch, to 2.2 pounds. By its use conditions encountered in ascending from the earth at an ordinary temperature to 40,000-foot altitudes may be simulated.

This particular stratosphere chamber for testing guns has three compartments. Its total length is 50 feet. The first compartment takes enough of the interior space to hold an aircraft cannon with its barrel projecting through into the second compartment, which is 22 feet in length. The third compartment is a sandtrap chamber of reinforced concrete holding 20 tons of sand.

When a cannon is to be tested it is put in place in the gun compartment. The chamber is sealed, and the temperature and the pressure are lowered, simulating atmospheric conditions being met by a warplane rising from the earth into the stratosphere. When the conditions of a desired altitude are obtained the cannon is fired. The shell

passes through the 22-foot compartment and through a port-hole into the sandtrap.

The changing conditions encountered in ascending to a high altitude cause a terrific shock contraction to all metals, many of which contract at different rates. It is important to know how this effects firing mechanisms and gun barrels. Also the lack of oxygen and sub-zero weather have an effect on the detonation and speed of the projectile. These essential matters may now be studied by use of the new stratosphere chamber. In the past they have been determined only in actual combat.

Science News Letter, October 30, 1943

ENGINEERING

Vacuum System Devised For Shoal-Water Propeller

► LANDING BARGES and other shoal-water craft have their propellers completely protected, and yet given the benefits of deep-draft "bite" in the water, in a unique construction system devised by George G. Cooke, New York inventor.

The propeller is mounted above water-level in a slope-sided well rising into the central part of the hull. Above the highest point in the well is a narrow standpipe, connected to a vacuum pump driven by the engine. The standpipe may be of any height up to 28 feet, the limit to which atmospheric pressure at sea level will lift a column of water.

When the pump is in operation, water is pulled up into the well and the standpipe. The propeller acts on this mass, which has properties of water as deep as the column in the standpipe is high. It is good, "solid" water, instead of being "full of holes" and hence an unsubstantial basis for the propulsion thrust, as water near the surface frequently is.

Several other advantages are claimed by the inventor. The propeller is always up out of harm's way, even if the boat runs over sandbars, logs or other submerged obstacles. If grounded, the reversed propeller digs the boat free by hydraulic action of the forward-pushed current. The water mass in the well seems to act as a sort of inverted centerboard, increasing stability.

Adjustments and repairs on the propeller are easily made, Mr. Cooke states. Since the center well drains when the vacuum system is not operating, it is merely necessary to open a manhole and go to work, without having to fumble around a submerged propeller or dry-dock the boat. Patent rights in Mr. Cooke's propulsion system are vested in the Shallow Water Boat Company.

Science News Letter, October 30, 1943

SCIENCE SUBJECTS Gain NEW Interest



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PUBLIC HEALTH

Spreading Paralysis?

Mystery of how infantile paralysis spreads still unsolved, though sewage, flies and mucous droplets are all under suspicion.

► THE MYSTERY of how infantile paralysis spreads has not yet been solved, although sewage, flies and mucous droplets on human breath are all more or less under suspicion, Dr. Howard A. Howe, of the Johns Hopkins School of Hygiene and Public Health, told members of the Federation of Sewage Works Associations meeting in Chicago at a wartime conference on sanitation.

Dr. Howe summed up the views on the subject of both himself and his associate at the Hopkins Poliomyelitis Research Center, Dr. Kenneth F. Maxcy, who is now out of the country.

The case for spread via sewage rests on two facts: 1. The virus of the disease has repeatedly been found in intestinal wastes from patients and healthy carriers. 2. The virus has on several occasions been found in city sewage when cases of the disease were at a maximum.

Attempts to determine whether chlorination of water is effective in destroying the virus in water supplies that might become contaminated have been inconclusive, Dr. Howe said, because the experiments have not duplicated actual

conditions closely enough.

Chief reason why epidemiologists do not believe that infantile paralysis is spread by contaminated water is that the epidemics do not behave like epidemics of other water-borne diseases such as typhoid fever. The disease has never been correlated with poor water supplies nor have explosive outbreaks of widely scattered cases occurred in cities with municipal water systems. This would be expected if the virus were spread through the water mains.

Flies can carry the virus of infantile paralysis, but it seems unlikely that they play much part in spreading the disease. They are not, for one thing, invariably associated with the disease. The disease, moreover, chiefly attacks children, which would not be the case if it were spread primarily by flies or other insects.

The virus is also found in the walls and secretions of the pharynx, in the throat, which suggests the possibility that it may be spread from one person to another by droplets of mucous from the pharynx.

Science News Letter, October 30, 1943

the shrill steam whistle of past years was cited as such an advance.

Sound reduction and air conditioning are closely allied as in the modern air-conditioned trains and buildings. By eliminating the necessity for open windows for ventilation, it is possible to exclude almost all exterior noise.

Relatively quiet operations or devices may be substituted for those causing noise in some cases. Examples are: Use of welding instead of riveting in building, replacing light signals for telephone bells and other noisy devices intended to attract attention.

Installation of acoustic material on the walls or elsewhere, such as the increased use of carpets, wall hangings and drapes, is also useful in noise control.

These and further measures were suggested in the report of American Medical Association's Committee to Study Air Conditioning for the purpose of showing that much current noise is needless; that effort against noise is a widely neglected but legitimate portion of overall warfare; that methods of noise control are practical and no longer technically mysterious; and behind some of the more publicized evils of the day, such as wilful absenteeism, may be found the insidious disturbances from noise.

Science News Letter, October 30, 1943

ASTRONOMY

Comet Rediscovered As Predicted in 1935

► COMET COMAS-SOLA, last seen in 1935, has been rediscovered. Miss L. Oterma, Finnish woman astronomer, on Oct. 2 located it in the constellation of Cetus, near where it had been predicted that the comet would reappear.

Harvard College Observatory, clearing house for astronomical information, received this report in radio message relayed through Sweden.

Science News Letter, October 30, 1943

PUBLIC HEALTH

Noise Remedies

Public needs to be convinced that noise is unnecessary. Suggestions given on how to reduce the amount of noise in industry and everyday life.

► IF NOISE gets on your nerves, a few things that you can do about it are suggested in a report by Dr. Carey P. McCord and John D. Goodell of Detroit. (*Journal, American Medical Association*, Oct. 23)

If the loud ticks of a watch on a tabletop keep you awake, hang it up and you may be unable to hear it. The principle involved is that the tabletop acts as a sounding board and amplifies the noise of the watch.

The public needs to be convinced that noise is unnecessary, the report states. Many law-abiding citizens, the report recites, who under no circumstances would

contemplate the sending up of a rocket flare on a public street, or turning a flood light on an apartment house to attract the attention of a friend, will unhesitatingly blanket a house or an entire block with resounding noise from a badly designed automobile horn.

Automobiles should have horns that do not frighten people with shrieking noise, the report suggests. Just as it is possible to train a dog to wag his tail when he hears a pleasant word, so human beings could be educated to respond to a simple non-irritating sound as a danger warning. Use of a mellow horn on modern diesel locomotives instead of

Books

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Bears and Men

► BEARS have always had a strangely close association with human history. Even before history, contact between men and bears must have been close and frequent—too much so for the comfort of the human beings, at times; at others, too much so for the comfort of the bears. For primitive man used as shelters exactly the kind of caves that the long-extinct giant cave bears also wanted for homes. So even with the crude weapons at their command, cave men killed cave bears; bear bones and primeval flints are found together by thousands, buried in the floor litter of the ancient caverns. Presumably the bears got the better of the argument, too, sometimes.

Reviewing the association of bears and men in Europe, in the British archaeological journal *Antiquity*, Colin Matheson calls attention to hints of bear cults in ancient religions, beginning with the possibility that the cave men who killed the bears also revered them, as some primitive tribes still do. The bear figured prominently in the worship of Artemis (Diana) in parts of ancient Greece; it is suggested that originally the goddess herself was a bear, and that her role as a maiden huntress was a later, more sophisticated development.

Considering how much more intimately cave bears were associated with early man than were the wild dogs of his time, it may be conjectured that the bear missed becoming the first domesticated animal only because of his stupidity and untamability. Had he been intelligent, like the dog, or even docile without being intelligent, like the sheep, the bear might have been man's first pet, his first animal servant. We might

today have watchbears in our kennels, perhaps even miniature lapbears lolling on cushions in the boudoirs of fashionable dowagers.

The wild bear that thus missed becoming a tame bear was quite distinct from existing bear species, in both Old World and New. It was a big animal, but shaped rather differently from the European brown bear and the American black and grizzly bears; and it had a decidedly shorter nose. It became extinct at some time near the end of the Ice Age, more probably because of disease than through the persecutions of human hunters. At any rate, many of the bones found in the caves are defective or malformed.

The European brown bear, which succeeded the cave bear, was once abundant on the Continent as well as in the British Isles. Bears were used, hundreds at a time, in bloody spectacles in the Roman arena. They were hunted all over Europe during the Middle Ages. They became extinct in Britain first, about the ninth century; in the populated parts of France, Germany and other mainland countries they survived much longer. There are some still to be found in the Pyrenees, Carpathians and other wilderness-covered mountains of the Continent.

Science News Letter, October 30, 1943

NUTRITION

Concentrated Protein Extracted From Grass

► A HIGH-PROTEIN feed obtained directly from grass by chemical extraction is suggested as a possible substitute for war-scarce "concentrates" like grain and oil meal in livestock feeding, by Dr. T. J. Sullivan of the U. S. Regional Pasture Research Laboratory. In an issue of *Science* (Oct. 22), Dr. Sullivan tells of preliminary small-scale experiments along this line which he has performed.

In one of them, he soaked dried ground grass overnight in a solution of caustic soda, then filtered it through cheese-cloth and treated the liquid with hydrochloric acid. He dried and ground up the precipitate thus formed.

The dried substance was dark green in color, with a grassy flavor. On a dry-weight basis it contained 58% protein, 6% minerals and less than 1% lignin and cellulose—roughage, in feeding terms. Dr. Sullivan calculates that a ton of dried grass would yield about 285 pounds of this protein "concentrate."

The grass residue, still containing 44% of the original protein "appeared to be a fair quality stock feed."

Dr. Sullivan suggests that "either the crude or the extracted product could be made from surplus forage, or forage otherwise wasted, and if economically produced should be useful in supplementing present stocks of protein concentrates, particularly for poultry and hog rations."

Science News Letter, October 30, 1943

ORDNANCE

Peep sight for Firearms Patented by Garand

► MILITARY inventions are well represented among the new patents recently issued. Prominent among these is a rear peep sight for firearms invented by the noted gunsmith, John C. Garand of the government arsenal at Springfield, Mass., covered by patent 2,331,903.

The gunsight consists basically of an L-shaped member, mounted on the barrel by means of a transverse hinge. Each arm of the L is pierced by a peep sight aperture near its upper end. The two arms are unequal in length, so that two quickly adjusted elevations are possible on the weapon. This is essentially the sight used on the new Army carbine. Royalty-free rights for manufacture and use are assigned to the U. S. government.

Science News Letter, October 30, 1943

AGRICULTURE

Better Machine Harvester For Sugar Beets Invented

► THE GROWERS of sugar beets may soon dispense with more of the hand labor now used in harvesting the beets by use of an improved machine harvester. The horse- or tractor-drawn implement carries a plow-like lifter which penetrates the ground below the beets and raises them to the surface, shaking out the earth. The machine cuts off the beet tops, and separates the foliage from the roots. It is somewhat similar to mechanical potato diggers used in potato-raising sections. The improvements relate particularly to better automatic action.

The patent (No. 2,331,520) was granted to William E. Urschel, Valparaiso, Ind., who claims the machine may be used with other root crops.

Science News Letter, October 30, 1943

• New Machines and Gadgets •

• TAKING THE SHINE OFF old suits and coats is the achievement claimed by a new chemical product. This preparation, neatly packaged in a compact kit with wooden block and re-napping cloth, is designed to remove the shine from clothing or upholstery without injury to the fabric.

Science News Letter, October 30, 1943

• COTTON DRYING is accomplished economically with a new drier furnace which uses direct heat from oil or gas. Fire-brick lines the combustion chamber, but common brick is used on the outside. A filter of fine glass fibers screens out sparks and dirt from the hot air.

Science News Letter, October 30, 1943

• AN ELECTRIC DEVICE, still in an experimental stage, gives promise of being able to sort out messages on a teletype circuit and pass to the local teletype printing machine only messages intended for that local station. It works with a combination of relays.

Science News Letter, October 30, 1943

• UNIQUE two-color wall charts show the proper rivets to use in various types of work. They were prepared by a rivet manufacturer for use in shops and schools.

Science News Letter, October 30, 1943

• RELIEF from arthritis pains is offered by transparent plastic cups placed inside the human body over the bone heads in ball-and-socket joints. The excess growth on the bone head is re-



moved before the cup is put into position. The plastic acts as a lubricant, and being transparent, does not prevent taking X-ray photographs. A cup is shown in the illustration.

Science News Letter, October 30, 1943

• AIRPLANE liquid-cooled engines may employ a new method of dissipating excess heat. An invention, now patented, uses the sheet metal wing surface for heat dissipation. Suitable conduits bring the cooling liquid inside the wings to fins attached to their inter-

rior surfaces for wing dissipation.
Science News Letter, October 30, 1943

• ZINC AND CADMIUM surfaces may be protected against corrosion by a new, super-thin coating which is easily applied. The coating does not chip or flake off because it is soaked up by the plated metal and becomes an integral part of it.

Science News Letter, October 30, 1943

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 180.

• Just Off the Press

AMERICAN ANNUAL OF PHOTOGRAPHY 1944—F. R. Fraprie and F. I. Jordan, eds.—*Amer. Photographic Pub.*, illus., 206 p. \$1.50 paper, \$2.25 cloth, vol. 58.

ANNUAL REPORT OF THE BOARD OF REGENTS OF THE SMITHSONIAN INSTITUTION: Showing the operations, expenditures, and condition of the institution for the year ended June 30, 1942—*Gov't Printing Office*, illus., 421 p., \$1.50.

BIOLOGICAL SYMPOSIA: A series of Volumes Devoted to Current Symposia in the Field of Biology—Jaques Cattell, ed.—*Jaques Cattell*, 334 p., illus., \$3.50.

BURNING AN EMPIRE: The Story of American Forest Fires—Stewart H. Holbrook—*Macmillan*, illus., 229 p., \$2.50.

CULTURE ELEMENT DISTRIBUTIONS: XXIV CENTRAL SIERRA—B. W. Aginsky—*Univ. of Cal.*, illus., 75 p., 75c, paper.

CULTURE ELEMENT DISTRIBUTIONS: XXIII NORTHERN AND GOBIOTE SHOSHONI—Julian H. Stewart—*Univ. of Cal.*, illus., 129 p., \$1.25, paper.

FIRST THE FLOWER, THEN THE FRUIT—Jannette M. Lucas—*Lippincott*, illus., 72 p., \$2.

FUNDAMENTALS OF RADIO: For Those Preparing For War Service—L. O. Gorder, K. A. Hathaway, C. H. Dunlap—*Am. Tech. Soc.*, illus., 372 p., \$2.

THE MEAT WE EAT—P. Thos. Ziegler—*Interstate Pub.*, 376 p., illus., \$2.70.

NOTES ON THE CULTURE OF THE YANA—E. Sapir and L. Sapir—*Univ. of Cal.*, illus., 55 p., 75c, paper.

PHYSIQUE, PERSONALITY AND SCHOLARSHIP: A Cooperative Study of School Children—M. M. Adkins and others—*Nat. Res. Council*, illus., 705 p., \$1.50, paper.

PLAY CENTERS FOR SCHOOL CHILDREN: A Guide to Their Establishment and Operation—Adele Franklin and Agnes E. Benedict—*Morrow*, 153 p., illus., \$1.50.

SIMPLIFIED MATHEMATICS AND HOW TO USE THE SLIDE RULE: F. A. Rappolt—*Doubleday, Doran*, 300 p., \$2.95.

SLIDE RULE SIMPLIFIED—C. O. Harris—*Amer. Tech. Soc.* illus., 258 p., \$3.50 with slide rule, \$2.50 without rule.

SQUARE PEGS IN SQUARE HOLES—Margaret E. Broadley—*Doubleday, Doran*, 211 p., \$2.50.

THE STAR FINDER—Henry M. Neely—*Smith & Durrell*, 65 p., illus., \$2.75. A new kind of practical guide to the heavens for those who want to know the night sky. Charts in the book can be used for locating stars.

THE STRUCTURE OF MORALE—J. T. MacCurdy—*Cambridge Univ.*, 224 p., \$2.

A TREASURY OF SCIENCE—Harlow Shapley, Samuel Rapport, and Helen Wright, eds.—*Harper*, 716 p., \$3.95.

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